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GULSTONIAN LECTURES.

On Fever and Inflammation. Delivered before the Royal College of Physicians, London, 1859. By WILLIAM ADDISON, M. D., F. R. S., F. R. C. P.

LECTURE III.

XIV. *Continued Fever.*—In the sixth volume of the *Transactions of the Medical and Physical Society of Calcutta*, there is a paper by Mr. Leslie, On the Diseases of Gowhattee, the capital of Lower Assam.

"The poorer inhabitants of the town," says Mr. Leslie, "are badly lodged, clothed, and fed. They sleep on a thin mat, spread upon the ground; their food is chiefly rice, and fever is often introduced by an intractable form of bowel complaint. The disease consists in inflammation and ulceration of the large intestines; and so insidious is it that in many cases emaciation has advanced to a great degree, and ulceration of the colic mucous membrane has taken place, before the patient applies for assistance. In such circumstances, he has no pain, or prominent or urgent complaint to make; scarcely allows he is ill, or has loose stools; he merely feels weak and wastes slowly. But, when fever comes on, the patient wastes rapidly, with thirst, loss of appetite, smooth red tongue, hot skin and frequent pulse. Œdema of the extremities appears, and the disease generally proceeds to a fatal termination amidst the most extreme degree of debility."

Mr. Leslie gives a tabular view of forty-seven fatal cases of the disease, with the appearances on dissection, from which it results that every variety of lesion of the mucous membrane of the colon was observed; from inflammation and purulent secretion, lining the membrane, to abrasion and ulceration, various in extent and depth, or even to mortification.

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We contrast this form of fever observed by Mr. Leslie, with fever reported on by Dr. Craigie, which appeared in Edinburgh in 1834 and 1835. One hundred and seventy-four cases were treated; and of these, in one hundred and twenty-six, or seventy-three per cent., the head was the principal part affected. Of twenty-four examinations, after death, brain affections were found in twenty-two. Speaking of these results, Dr. Craigie says, emphatically:—

"We have had several examples of fatal fever, with lesions of the mucous membrane of the stomach, and sometimes enlargement of the intestinal follicles; but we have almost none of *dothinenteritis*, which have been so commonly observed elsewhere. In the whole of the cases treated by myself, there was only one in which the follicles were so much diseased as to justify particular importance being attached to it, and in this case the ulcerations observed must have existed prior to the fever."

Dr. Robert Perry, from the year 1831 to 1835, made careful observations in upwards of four thousand cases of fever, in Glasgow. Three hundred necroscopic examinations were made; and he dwells particularly on the necessity of distinguishing true typhus from *dothinenteritis*, or typhoid fever.

"Contagious typhus," he says, "is an exanthematous fever, solely produced by the introduction into the system of a specific poison, generated in the human body. It runs a certain course, which may be modified, but cannot be stopped. It is most contagious when the patient is convalescent, the poison being spread abroad by the desquamation of the cuticle. *Dothinenteritis*, or enlargement of the mucous follicles of the smaller intestine, and enlargement and ulceration of the aggregated glands of the lower third of the ileum, is a disease *per se;* and, though it occurs in combination with contagious typhus, it is a different disease, of different origin. It begins with bowel complaint—sometimes so slight at first as scarcely to attract the patient's attention. Afterwards, fever arises. This disease," Dr. Perry goes on to say, "may exist in every degree of mildness or severity; it has no regular period of termination. The fever may run on for two, three, or four weeks, and terminate in gradual restoration to health without any sensible crisis; or the patient may sink under it from exhaustion, or by hemorrhage from the bowels; or it may end by some of the ulcers of the aggregated glands of the lower third of the ileum penetrating the coats of the intestine."

It is well known, from various afflicting causes—unwholesomeness and insufficiency of food, cold, wet, fatigue, and exposure—that the British and French armies on the heights before Sebastopol suffered an extraordinary amount of sickness; the British army chiefly in the winter of 1854 and 1855; the French army principally in the winter of 1855 and 1856. The former, numbering twenty-three thousand soldiers on its muster-roll, had upwards of twelve thousand at one time in hospital; the latter, in January 1856, had thirteen thousand; in February, twenty-one thousand; and in March, eighteen thousand sick and wounded men, distributed in various hospitals, and in other places that could be hastily obtained for their accommodation and treatment. The chief diseases from which these men suffered were, frost-bites, scurvy, chronic dysentery, diarrhœa, and fevers.

"Contagious typhus, scurvy, dysentery, frost-bites, and hospital gangrene," says Dr. Bryce, speaking of the French hospitals on the Bosphorus, in the winter of 1855 and 1856, "abound; but the first-mentioned disease, by its virulence, extent, and type, is more deadly than all the others taken together." The very large development of scurvy, and the outbreak of contagious typhus, exhausted the sanitary means of the French at Constantinople; and Dr. Bryce noted with astonishment the crowding and filthiness of the patients, the foulness of the bed and body clothes, the unwholesome and ill-ventilated state of the wards, and the stenches arising from various sources. The picture drawn by this gentleman, from personal observation whilst rendering his valuable services to the sick, is one of the most painful and heartrending to be found in the medical records of camps and hospitals.

"I could have no difficulty," says the Doctor, "in pointing out the fallacy of confounding, under one denomination, *two fevers* essentially distinct in respect of symptoms, course, morbid lesions, and etiology. * * * * In the contagious typhus, studied in the French hospitals, as elsewhere, there are present the characteristic maculæ and petechiæ, very distinguishable from the rose-coloured papulæ of typhoid fever. In the former there are absent the abdominal

symptoms so prominent and almost pathognomonic of the latter. Equally absent are the anatomic lesions, which constitute the morbid state of typhoid fever, namely, morbid state of the intestinal follicles, mesenteric ganglions, and spleen. * * * The number of surgeons who have fallen as sacrifices to their duty is almost without parallel. Forty-six died from typhus alone; scarcely one escaped an attack. There was fear lest the sick should be left utterly without skilled help. Sisters of charity, clergymen, orderlies, and all whose duties compel them to pass several hours daily in the service of the wards, have been, with few exceptions, attacked. But worse even than this is the deplorable fact that patients, labouring under scurvy and bowel diseases, when their progress to recovery is established, are seized with contagious typhus.

The vast proportion of the patients, the soldiery, showed, by their attenuated limbs and sunken countenance, a by-gone period of privation of proper nutriment; and the resemblance, in external aspect, of these patients to those suffering from fever during the famine years in Ireland, was very striking. On the other hand, "I have seen," says Dr. Bryce, "in the orderlies, and in others attending upon the sick in previous good health, the sudden invasion of typhus, marked by rigors, intense heat, headache, and delirium; and oftentimes the termination was as rapid and unexpected as the onset. These circumstances are very different from the slowness and incertitude of the same nominal state in typhoid fever."

If we note the series or order of events as related by these several observers, it is, in Mr. Leslie's report, poor diet, hardships, bowel complaint, dysentery, emaciation, and lastly, fever. In Dr. Craigie's cases, it was first fever, headache, and then cerebral and pulmonary affection.

Dr. Perry expressly says that he had to treat two fevers; one beginning with bowel complaint, sometimes so slight at first as scarcely to attract the patient's attention; the other was the contagious typhus. In the hospitals at Constantinople, we have the testimony of Dr. Bryce to the same effect. He had no difficulty in pointing out the fallacy of treating, under one denomination, two fevers, distinct in their etiology; the one supervening on previous forms of ill health, on bygone periods of hardship and suffering; the other attacking the orderlies and attendants on the sick—persons in good health and comfortable circumstances until prostrated by fever. The facts place before us two fevers, the one, contagious typhus, striking down the healthy; the other, typhoid fever; and the question, as regards the latter form of fever, is: Whether or not anatomical lesions, from which morbid matter may be absorbed into the blood, exist before the fever, as they do in hectic fever?

Now in the case of the sailors we have before mentioned, the men transacted the duties of the ship with ulcers on their legs. In many other instances, persons walk about with extensive ulcerations on the legs and elsewhere. Persons in consumption pursue their daily avocations with suppuration and ulceration in the lungs. In the cases of fever observed by Mr. Leslie, emaciation was apparent, and ulceration of the colic mucous membrane had taken place before the patient applied for assistance—before symptoms of fever appeared. The history of perforating ulcers of the stomach proves that, in many cases, persons do not complain of illness with ulceration of the mucous membrane of that organ. The anatomical lesion is not known to exist, little or no complaint being made until perforation of the coats of the stomach has occurred. In the case of fever, expressly noted by Dr. Craigie as associated with disease of the mucous membrane of the bowel, he says that the local disease existed before the fever.

In the armies before Sebastopol, thousands of men with scurvy, diarrhœa, and dysentery, faced and did their duty. In the overcrowded and poorest parts of cities and towns, where hardships must be endured, sickness abounds: scrofula, scurvy, diarrhœa, dysentery, typhoid fever, and typhus. Under such circumstances, numerous poor persons certainly continue their avocations, with bowel-complaint, diarrhœa, and chronic dysentery. The person may have no pain, or prominent or urgent complaint to make, may scarcely allow that he is ill, or has loose stools; he merely feels weak and wastes slowly. Chronic ulcerations are preliminary conditions of hectic fever.

The inference is, that the anatomical lesions of diarrhœa and dysentery exist before: but are sometimes latent, until symptoms of fever appear. The fact cannot be demonstrated, neither can it be denied; and, in the absence of direct proof to the contrary,

collateral circumstances are in favour of the inference. Could it be demonstrated, hectic and typhoid would be essentially the same kind of fever; both occasioned by debasement of the plasma, from absorption of morbid matter through places of chronic ulceration or anatomical lesion. The differences between them would arise from differences in the situation of the anatomical lesions, and from difference in the qualities of the matter absorbed.

If it should be inquired why ulceration of the mucous membrane of the bowel (the ileum, or colon)—anatomical lesions of diarrhœa and dysentery—occasion typhoid, when chronic ulcerations elsewhere in the body occasion hectic fever, we should reply: Because the special function of the part affected gives specialty to the fever. The mucous membrane of the bowel is eminently an absorbing surface. Myriads of groups of cellular bodies naturally exist here, the contents of which are all normally tending inwards, towards the fluid of the blood, which is, indeed, their destination. And Peyer's patches in the small intestine are especially rich in absorbent vessels. Therefore morbid elements, from ulceration of these parts, are the more readily indraughted into the blood. Moreover, excretions of the alimentary canal are naturally offensive; these must mingle with the matter of the ulcerations; and, on that account, spoiled and offensive material, abnormally ebbing back into the circulation from places of ulceration or disease in the mucous membrane of the bowel, will more speedily and thoroughly debase the plasma than from ulcerations elsewhere in the body.

"Typhus fever," says Dr. William Fergusson, "may be called the endemic of the British Isles, and of the same parallels of latitude on the continent of Europe. But, besides the endemic, or aërial, origin of this fever, there appears to be another source of the typhoid poison; I mean that which arises in crowded hospitals, prisons, barracks, and other habitations. I acknowledge it to be unphilosophical and incongruous to imagine that two fevers, springing out of sources so distinct, should yet so entirely resemble each other that they have been treated, classed, and acknowledged for the same; nor can I afford any satisfactory explanation of this phenomenon. But the fact is certain that they do so arise; for in the contagious ulcer, or hospital gangrene, we possess a demonstrable, tangible, and visible proof of its existence. This ulcer is a local form—a visible personification, if I may use the term—of the typhoid poison. It never occurs but under the most distressful crowding of the sick and wounded, and it is then so highly contagious that all other ulcers, or even abrasions of the skin are speedily involved in its destructive course. The contagion is capable of inducing typhous fever upon the sound, healthy, inmates; but in the wounded, where the poison finds a *nidus* and a vent, instead of affecting the constitution generally, it commits its ravages upon the wounded limb. So strong is the predisposition to that form of pyrexia, called typhoid, that it is prone to become an aggravation and superaddition to other forms of fever. All the remittent types and degrees, as well as the catarrhal and peripneumonic fevers are apt, when long continued or improperly treated, to glide into it."

Now not only is the typhoid pyrexia thus apt to become, as Dr. Fergusson says, an aggravation to other forms of fever; but also it is apt to appear in cases of large surgical wounds, in other wounds, and in puerperal women, where there is lesion of the mucous membrane of the womb, and an offensive discharge. And, generally, of anatomical lesions with offensive discharges, the typhoid pyrexia is apt to become an aggravation.

From all the foregoing considerations, we set down the anatomical and casual distinctions between typhoid fever and typhus, as follows:—

TYPHOID FEVER.	TYPHUS.
Previous, and perhaps present, hardships and privations.	No previous hardships.
Chronic lesions of the mucous membrane of the bowel:	No chronic lesion of the mucous membrane of the bowel, or elsewhere.
Absorption of morbid matter from the anatomical lesions; and lastly—	No absorption of morbid matter to change the qualities of the fluid of the blood; but, first—
Fever, or disorder of the corpuscles of the blood, from debasement of the fluid in which they swim.	Fever or disorder of the blood-corpuscles from an aërial poison introduced through the lungs; the corpuscles of the blood being the first elements of the body disordered.

The points of distinction, as they relate to our argument, being that: In typhoid fever the blood-corpuscles are disordered in consequence of previous debasement of the fluid in which they swim; whereas in typhus they are disordered by a poison act-

ing directly on them in their passage through the lungs.

From the contrast above shown, it is evident that the condition of the patient is more complicated in typhoid fever than in typhus; for in a given case of each fever, the consequences of the fever may be the same, or equal; but the previous anatomical lesions, which occasion typhoid fever, introduce a most material element as respects the history, treatment, and termination of that form of continued fever.

But it has been concluded that disease of the blood-corpuscles may generate a contagious virus. In the inoculated smallpox, in the case of the physician before related, and in other contagious fevers, the quantity of morbid matter introduced into the blood is exceedingly small; but the magnitude of the effect is very great. The reason we have assigned is because the morbid matter disorders by contagion, or by a contact-action, the whole of the corpuscles of the blood. There are no reasons for excluding, in any arbitrary manner, a similar contact-action amongst the blood-corpuscles from morbid matter introduced into the blood through anatomical lesions in the bowel; especially in cases where the matter absorbed may happen to be particularly offensive; therefore, a severe form of typhoid fever may introduce the virus or poison of typhus.

We say it may do so; because, although the history of hectic fever shows that it is not every form of reactionary fever that gives origin to a contagious virus, still, inasmuch as the generation of a contagious virus in the blood and symptoms of fever go together, so, on the other hand, we apprehend we are justified in saying that the graver forms of typhoid fever do, or may, issue in the production of a contagious matter; thereby, persons in health—attendants on the sick—are struck down with fever; a fever, be it observed—in the persons who may have been attacked by fever in this way—of very different beginnings from the fever of the person communicating it; occasioned, not through debasement of the fluid of the blood from pre-existing anatomical lesions, but through a virus generated in the blood of the first patient, and attacking the second and healthy person through the lungs.

The history or sequence of the sickness which abounds in times of hardship or famine, substantiates the argument; for the order usually is: first, forms of inflammation without fever, ulcerations, boils, and eruptions; then follow bowel complaints, chronic dysentery, and diarrhœa; and, lastly, fevers—the typhoid and typhus. This sequence obtains, because hardships in diet disorder the bowels; and this disorder is comprised in the terms diarrhœa and dysentery. The anatomical lesions of chronic diarrhœa and dysentery occasion typhoid fever; and typhoid fever may beget the poison of typhus. Our own experience accords with the conclusion that the typhoid poison will sometimes beget fever in the healthy attendants on the sick.

Let us examine how far the facts observed in puerperal fever bear out the validity of our argument in this respect.

XV. *Puerperal Fever.*—Gestation and parturition are physiological acts; but the condition of the puerperal woman, immediately after her delivery, is one of a *quasi* pathological character in the following respects:—

The blood abounds in plasma elements, and forms, on withdrawal by venesection, a buffed coat. The uterus, just relieved of its contents, may be likened to an injured organ proceeding to recovery. The condition of its bloodvessels is one favourable to the ebbing back of morbid matter into the circulation, and there are offensive discharges from the uterus. Cruveilhier has seized this analogy in its minutest details. Dr. Ferguson too, dwells upon it. "The puerperal woman," he says, "is in a condition analogous to that of a person who has undergone a serious surgical operation. All the uterine vessels from which the placenta has been detached, form part of a large wound, and are bathed in the secretions which take place while this wound is healing." Such being the conditions of the puerperal woman, her medical treatment has become a matter of routine for the first three days, lest a chill, an emotion, or an error in diet, should change reparative reactions into forms of inflammation. And the words of Mr. Hunter, which we quoted in our first lecture, are applicable here. "Granulations may all at once fade away and lose their life; and pus of a very different quality is discharged when granulations are fading away, than when a sore is granulating freely."

The analogy, or rather perfect similarity,

between the condition of the womb in the puerperal woman, when, from a chill, an emotion, an error in diet, or any other accident, granulations have all at once lost their life, and the condition of the mucous membrane of the bowel in cases of chronic dysentery, as respects their both being sources of specially offensive matter, can scarcely be denied; and if it be not denied, then the same course of reasoning which has been employed in tracing the relation between ulceration of the mucous membrane of the bowel and typhoid fever, and between typhoid fever and typhus, is equally available in explanation of the relation of inflammation of the womb in the puerperal woman, to two forms of puerperal fever. That is to say: in the puerperal woman the conditions upon which inflammation of the womb supervenes are favourable to a debasement of the plasma, because there are anatomical lesions, and because, from the state of the uterine vessels, morbid matter is specially liable to ebb back into the circulation; and should this absorption take place to a degree sufficient to disorder the corpuscles of the blood, symptoms of fever, from deuteropathy of the plasma, would arise; that is, fever, from the same kind of antecedents as hectic and typhoid fever. But it has been concluded that disorder of the blood-corpuscles may issue in the generation of a contagious poison; consequently, in a lying-in hospital, a puerperal woman, in an adjoining bed, or in an adjacent ward, may become affected with fever from the illness of the first patient; a fever, be it observed, in this second case, of very different beginnings from the first; occasioned not through anatomical lesions and debasement of the plasma; but by a poison generated in the body of the first patient; affecting the second woman from the air and through the lungs.

On referring to the literature of puerperal fever, it is seen that physicians have been divided in their views concerning the pathology of that disease; some holding the opinion that puerperal fever is an idiopathic fever; others regarding it as a local inflammation, taking the form of peritonitis, metritis, or uterine phlebitis. These two views, there seems to us no necessity for placing in antagonism. In all cases of puerperal fever there are forms of inflammation and fever; but, if there be truth in our doctrine of fever, it is of the utmost importance in any given case of puerperal fever, to determine whether inflammation has, or has not, preceded and been a cause of fever. If it has, the fever is a reactionary, or plasma fever, *i. e.*, fever from debasement of the plasma, and anatomical lesions precede the fever; if it has not, the fever is a primary or aërial fever, and independent of any inflammation or anatomical lesion, except what may follow from it.

Upon the subject discussed in this section, it has been suggested that we have offered no proof of the existence of *granulations* in the interior of the puerperal womb. But, as we have said in the first lecture, granulations are simple cellular growths; their shape and colour are not essential to their definition; and certainly "the large wound from which the placenta has been detached" can heal only through the intervention of new cellular growths, which may, from unsuitable conditions, "all at once lose their life and fade away;" and should they do so, then reparative reactions are changed to forms of inflammation—a granulating wound is "all at once" changed into an ulcerative one.

XVI. *Crisis, Protraction, and Relapse: Fever.*—There are no diseases in which the transition from unfavourable to favourable symptoms is more marked than in primary contagious fevers. Thus, in typhus, in the great majority of those who recover, the turn in favour of the patient is determined within a period of twenty-four hours. In our exposition of fever, we have treated the corpuscles of the blood as living bodies. And in all phenomena depending on the actions of living bodies there are epochs or periods; there is a time of germination, maturity, and decline. And symptoms of fever, because they are based upon an independent action or metamorphosis of the blood-corpuscles, have also their analogous epochs.

When the fluid of the blood is disordered short of affecting the corpuscles, and some form of inflammation arises for its depuration, there is but one preternatural depurative reaction, namely, that of the fluid upon the common tissue, denoted by the inflammation. But in fever there are two preternatural reactions: one, and the first, that of the corpuscles, whereby they extricate themselves from a virus; or, in other words, excrete a poison, and transfer it to the fluid in which they swim; the other, and subse-

quent one, that of the fluid whereby the virus is handed over to the common tissue for expulsion by some form of inflammation. In both kinds of inflammation, namely, those without fever, and those consequent on fever, the inflammation has reference, not to the state of the corpuscles, but to the state of the fluid of the blood.

The crisis, or maturity and termination of fever, then, depends on two events, both of them vital actions: *first*, the discharge of the virus from the corpuscles; and *secondly*, its discharge from the plasma. If there be obstacles to the discharge of the virus from the corpuscles, symptoms of fever will be protracted; should there be hindrances to its discharge from the plasma, forms of inflammation will be protracted.

If the corpuscles have freed themselves from the virus, but there are hindrances to its discharge from the plasma, then the imperfectly depurated fluid may react upon the convalescing corpuscles, and symptoms of fever be renewed. And the more probable will be this renewal, or relapse, where inflammation is acting the part of a depurative organ. But let it be observed in the circumstances presumed, the fever into which the patient relapses has a different *condition précédente* from the fever with which he was first attacked. The first fever has an aërial origin, the second, or prolonged fever, is due to imperfect depuration of the plasma. Let us examine this point in more detail.

When causes of hardship and sickness abound in the mixed population of a crowded city, complex forms of illness must often occur. These it is very difficult to unravel, because the persons are not, or have not been, continuously under medical observation. We therefore again refer to the crew of a ship, where, from the inmates being seen daily, and from other circumstances, the sequence of events can be better followed.

Formerly, in long voyages, it has not unfrequently happened that a salt diet, bad water, and confinement on board the ship, have produced in the men that state of blood which founds, upon the slightest local provocation, chronic ulcerations on the exterior of the body. Also, in addition to the exterior ulcerations, various forms of bowel complaint, diarrhœa, and chronic dysentery, have been present. With the crew in these conditions, the ship has sailed into an unhealthy port, and some of the men have taken fever from the poisonous atmosphere of the shore. Here fever has arisen from the aërial source; but the symptoms, history, and termination of the fever will vary greatly in the different men; because the anatomical conditions in which they severally are when they enter upon fever are different. And when the aërial fever has run its course, or when its proper epoch of termination has arrived, we have seen men linger in fever, or seem to fall back—relapse—into fever. The reason is because the latent anatomical lesions, present before the aërial fever set in, have now, from the commotion of that fever, themselves become influential by giving indraught to morbid matter into the blood; in creating, not a continuation of the aërial fever, but another—the typhoid pyrexia, or fever. In such cases the patient no doubt relapses into fever; but he does not relapse into the same fever; it is into another and a different one.

"During seven months in 1831, eleven hundred and forty-five cases of fever were treated by me," says Dr. Perry, "to a termination. Of this number there were nineteen relapses, averaging one in sixty; and I was particularly struck with the fact that these relapses, almost altogether occurred in patients who had been admitted in hospital on account of some local inflammatory affection; and who had caught fever in the house, or who were seized with it shortly after leaving the house. The incorrectness of calling *these* cases of relapse, is quite manifest, as it was an entirely new disease. It is as absurd to talk of a relapse of typhus fever as to talk of a relapse of smallpox, scarlet fever, or measles. When an increase of fever takes place after the crisis of typhus, it is owing to some other disease."

Renewed accessions of fever after the crisis of typhus are regarded by Dr. Perry, and we think correctly, as analogous to renewed accessions of fever, after the crisis of scarlet fever, from disease of the kidneys, or from anatomical lesion in any other important organ. And generally, respecting the contagious fevers—scarlet fever, measles, smallpox, and typhus—it may be concluded of persons lingering in fever much beyond the natural periods of these fevers, that the fever of the latter part of the period is not the fever of the first part of it. It is thus, we apprehend, that persons are not unfrequently said to have scarlet fever and

typhus. That is to say, more correctly, the typhoid pyrexia, from some anatomical lesion giving inlet to morbid matter to the blood, may follow close upon the primary fever. And it is not difficult to understand that an aërial fever may, through anatomical lesions occasioned by that fever, *glide* into typhoid fever without any interval by which the term relapse is made appropriate.

Thus fevers may interchange, or the one may be supplanted by the other. For persons may be approaching, or have just entered the state of typhoid fever, when an aërial poison introduces and substitutes the dominating typhus. On the other hand, persons recovering from the aërial fever, typhus or scarlet fever, may, through anatomical lesions, lapse into typhoid fever; but for fevers thus to glide, or relapse, into one another, the *conditions précédentes* of both fevers must have been present.

"Great numbers of the sick," says Dr. Bryce, "admitted into hospital with scurvy, dysentery, and diarrhœa, were approaching, or had already symptoms of typhoid fever; when, upon being crowded together with others suffering from the true contagious typhus, that disease dominated all the rest." Our interpretation of the fact noticed by Dr. Bryce, is that irritation, or disorder of the corpuscles of the blood—denoted by symptoms of fever—arises from debasement of the plasma; but that, when an aëriform poison of specific qualities reaches them, in their passage through the lungs, a contagious abnormal metamorphosis of the corpuscles is substituted in place of simple irritation. Also, in contagious fever, when the abnormal metamorphosis of the corpuscles has run its course, irritation of the corpuscles may continue, if anatomical lesions, giving inlet to morbid matter, remain.

Hectic and typhoid fevers are, then, both of the reactionary class; for both arise from debasement of the plasma through absorption of morbid matter from anatomical lesions. But the site of the lesion and the quality of the matter absorbed, occasion important differences in the history and symptoms of the two fevers. Then, again, of the two fevers in puerperal women, the one is a reactionary or plasma fever; the other is a primary or specific fever.

It results, then, that anatomical lesions, giving inlet to morbid matter to the blood, exist prior to the appearance of the typhoid pyrexia, or typhoid fever; the quality of the matter absorbed distinguishing this pyrexia from hectic fever. Contagious typhus belongs to a different class of fevers. Nevertheless, the typhoid pyrexia may introduce the poison of typhus. The order of events then may be as follows: Hardships in diet, diarrhœa, the anatomical lesions of diarrhœa giving inlet to morbid matter to the blood, typhoid pyrexia, typhoid pyrexia generating the virus of a primary fever. On the other hand, the order may be: Aërial miasma, primary contagious fever, an anatomical lesion occasioned by that fever giving inlet to morbid matter to the blood, typhoid pyrexia.

We here give a tabulated view of these results, with the following explanation:—

Primary and generally aërial.	Specific and infectious.	Smallpox, scarlet fever, measles, typhus, etc.	Corpuscles of the blood diseased *before* distemperature of the plasma.
Reactionary or plasma fevers.	Hectic and non-infectious.	From diseased joints or bones, pulmonary consumption, and other chronic anatomical lesions, with bland discharges.	Corpuscles of the blood disordered or diseased in *consequence* of debasement of the plasma.
	Typhoid and mixed.	From anatomical lesions of the mucous membrane of the bowel; of the puerperal womb; from surgical wounds and other anatomical lesions, with fetid and ichorous discharges.	

In this table, the first column exhibits two classes of fever; and the last column shows how we consider them dependent upon the physical constitution of the blood, and upon properties usually assigned by physiologists to the corpuscles.

Injurious substances dissolved in the air and inhaled by the lungs, and specific poisons introduced in very small quantity into the blood, produce infectious or *contagious fevers*. A contagious virus is generated in the blood; and forms of inflammation follow upon the fever. The examples in this country are smallpox, scarlet fever, measles, and typhus. In these fevers, it is the *quality* and not the *quantity* of the poison which is operative. For the quantity, as in the inoculated poisons, may be *exceedingly small*; but its effects are great, by reason of some independent action excited

by it in the blood itself. This independent action, which extends through the whole mass of the blood, is, we say, the result of a contagion, contact-action, or fermentation amongst the blood-corpuscles; an *abnormal metamorphosis* which issues in the generation of a contagious virus. And the phenomena, because dependent on the vital action of cellular bodies—the blood corpuscles—have therefore *a crisis*, a more or less decided or marked epoch of rise, maturity, and decline. The rise, crisis, and decline of contagious fevers corroborates the conclusion which bases phenomena of fever upon the vital actions of cellular bodies.

Spoiled materials constantly ebbing back into the plasma from chronic anatomical lesions with *bland discharges*—such as diseased joints, protracted suppurations, pulmonary consumption, etc.—distemper the fluid of the blood; and reiterated or deuteropathic distemperature of the fluid disorders the corpuscles and produces *hectic fevers*. In these fevers, there is no evidence of that kind of independent action in the blood which issues in the generation of a contagious virus. They are non-infectious; therefore there is an absence of proof of any specific quality in the matter introduced into the blood. Hectic fevers, moreover, have no marked epochs of maturity and decline; and that the symptoms of fever depend upon the constancy and reiteration of the spoiled material seems proved; because they continue whilst the source of absorption continues, but disappear when it is removed, as it often can be, by amputation or by some other surgical operation. Hectic fever, then, depends on the permanence of the source of spoiled material; on a continuousness of absorption which debases the fluid, and, through the fluid, the corpuscles of the blood. Symptoms of fever follow from their disorder; but this disorder—if we may so speak—is one of constant fretting and irritation, from the constancy of the ebbing back of spoiled matter into the plasma. There is no independent action in the blood, such as issues in the generation of a contagious virus. Pathogenetical substances, then, introduced into the blood, occasion fever; by their quality, when a very small amount excites an independent action in the blood-corpuscles, which has its rise, maturity, and decline, and issues in the generation of an infectious virus; by quantity and reiteration, when continuousness of introduction occasions constancy of irritation amongst the corpuscles, denoted by hectic and non-infectious forms of fever, which decline and disappear when the source of morbid absorption is removed.

Interposed, as it were, between these two fevers—contagious and hectic—are *typhoid fevers or typhoid pyrexiæ*. These sometimes have the characters of the contagious, sometimes of hectic fever; because the forms and symptoms which these typhoid fevers may assume are determined sometimes by the quality, and sometimes by the constancy or reiteration of the morbid matter. In proportion as the quality is more offensive or specific—as when the source of absorption is hospital gangrene, ulceration of the mucous coat of the bowel, a surgical wound with an ichorous discharge, or the puerperal womb—the fever approaches in all its phenomena to the contagious forms of fever. On the other hand, the more the symptoms of fever depend upon reiteration of the morbid matter, as when the source of absorption is an anatomical lesion with a more bland discharge, then the more the phenomena observed in the patient approach to those of hectic fever.

There is no arbitrary assumption here, in arguing differences in the symptoms and phenomena of reactionary fevers from differences in the quality of the matter absorbed into the plasma of the blood from different conditions of anatomical lesions, or different states of ulceration. The fact of difference of quality in the matters discharged is demonstrated in surgical ulcers, some of which discharge a bland and laudable pus, others a thin, irritative, and fetid ichor. Nay, the same anatomical lesion or ulceration will differ in the quality of the matter discharged—and therefore in the quality of the matter which may be absorbed—on two consecutive days. It results, then, that if the corpuscles of the blood take on a general and independent action from a poison which may come into contact with only a few of them, an infectious or contagious virus is generated in the blood, and infectious or *contagious forms of fever* appear; whereas, if the corpuscles of blood suffer only constant irritation or fretting from the continuousness of the presence of an irritating matter in the plasma, a contagious virus is not generated, but *non-infectious* or *hectic* forms of fever arise. The contagious or primary, and the reac-

tionary or hectic, are the two classes of fever which we conclude to be dependent upon the physical constitution of the blood. In the one class, the corpuscles are disordered, irrespectively of the fluid in which they swim. In the other class, debasement of the fluid is antecedent to disorder in the corpuscles. But the two parts of the blood are much too closely associated with each other, for impairment of the quality of one part to continue without impairment of the qualities of the other part. Therefore fever of the one class may glide or relapse into fever of the other class. And it would seem, from the physiology of the corpuscles, that contagious fevers from aërial poisons must relapse into fever from debasement of the plasma, were it not so ordered that forms of inflammation perform the office of a depurating organ. The corpuscles of the blood generate the contagious virus, and they transfer it to the plasma; and should the specific form of inflammation characterizing the fever fail of fixing it in the common tissue, symptoms of fever are renewed.

The same poisonous atmosphere may be breathed for the same time by a number of persons, and it will produce fever only in a few of them; because the corpuscles of the blood have different degrees of resistance in different persons. A poison in the atmosphere is a *condition précédente;* it is not the logical *antecedent* of contagious fever. Some physiological element of the body must be disturbed, or must be interposed between the aërial poison and symptoms of fever. This physiological element we have concluded to be the corpuscles of the blood.

In like manner, it is not every distemperature of the fluid of the blood that occasions hectic fever. On the contrary, the first effect of simple distemperature of the fluid of the blood is to occasion new, or to aggravate existing forms of inflammation. It is only when the cause of the dyscrasy of the fluid is permanent and has overcome the resistance of the corpuscles, that symptoms of hectic fever appear. Anatomical lesions (ulceration and suppuration) have therefore only the same relation to hectic fever, that poisons in the air have to contagious fever. They are *conditions précédentes*, and not the antecedents of the fever. Extensive ulcerations and suppurations exist without hectic fever, because the anatomical lesions must have become continuous inlets of spoiled material to the blood, and the fluid of the blood must be thereby continuously debased before symptoms of hectic fever appear.

It has not unfrequently happened that persons in dissecting the dead body or in necroscopic inspections have pricked their finger; of such many escape without inconvenience, whilst another, more unfortunate, may be attacked with fever; and recover only after extensive inflammations and more than one large critical abscess. The reason is because the puncture, or anatomical lesion, is only a *condition précédente*. A contagious disorder amongst the blood-corpuscles is the proper antecedent of fever; and distemperature of the fluid of the blood is the proper antecedent of inflammation and critical discharge. Fever from the puncture, therefore, does not arise unless the blood-corpuscles be affected.

So, again, anatomical lesion, or follicular disease of the mucous membrane of the bowel, is a *condition précédente*, and not the *antecedent* of typhoid fever. A great number of persons may be suffering hardships, and may be afflicted with chronic dysentery and diarrhœa, or with follicular disease of the mucous membrane of the bowel; but only a very few of them may fall into typhoid fever; and these may not be those with the worst, or most extensive anatomical lesions. The reason is because the state of fever does not depend upon the anatomical lesions in the manner of an antecedent. Symptoms of fever make their appearance only when the lesions are giving inlet to morbid matter into the blood, which, either by quality, or frequency of iteration, disorders or irritates the blood-corpuscles.

It will be observed of this exposition that the *condition précédente* of fever, occasioned through miasma in the atmosphere, is external to, and apart from the body. A poison from the air affects the blood (the corpuscles) and fever is actually the first phenomenon of departure from health; whereas in reactionary fevers the *condition précédente* is within, or is a part of the body. Some anatomical lesion, and an irritative matter in the plasma, exist before, or are preliminary to symptoms of fever. A departure from the standard of health has therefore already occurred before; but, perhaps, without symptoms until the typhoid pyrexia appears.

In bringing our discourse upon a very

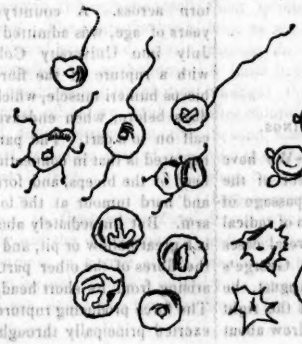
difficult and interesting subject to an end, we have only in conclusion to observe that the doctrine of fever we have propounded is based on the physiological and physical constitution of the blood; on the known properties of cellular bodies; and on microscopical examinations of the state of the plasma and bloodvessels in the process of repair and inflammation. The chief points of the doctrine are:—

The fluid of the blood has a pathology distinct from that of the corpuscles.

Forms of inflammation, or of local poisoning without fever, make their appearance when there is dyscrasy of the fluid only; forms of fever when the corpuscles are disordered.

These points are submitted to your learned judgment and impartial criticism, as propositions; though, to our mind, they assume the aspect of truths, derived, as they are, from years of experiment and research upon the qualities of blood, and of the elements of repair and inflammation.

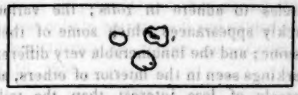
Upon the whole subject, the ideas we have endeavoured to express are, that numerous and various substances may circulate through the body dissolved in the fluid of the blood; and that the cellular elements of the body (including the corpuscles of the blood) have various affinities, and oppose various degrees of resistance to injurious matter. Therefore, if from distemperature of the fluid the common tissue be first disturbed, forms of inflammation first arise; if some local parenchyma be disturbed, the phenomena are those of local poisoning, delirium, coma, diuresis, purging, sweating, salivation etc.; if the corpuscles of the blood be first disordered, fever is the result.



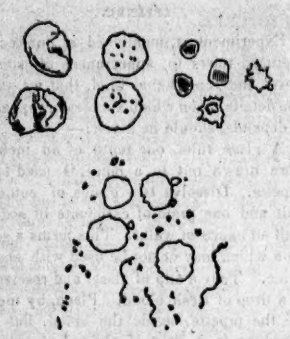
APPENDIX.

Experiment II, mentioned in our second lecture, refers to appearances of such a novel and remarkable kind, that we think the details, upon which success in repeating it depends, should be given:—

A glass tube, one-tenth of an inch in bore, drawn out to a point, is used for a pipette. Dissolve two grains of common salt and one grain of carbonate of soda in half an ounce of water. This forms a solution which may or not be used with sherry wine. Take a slip of glass, and receive on it a drop of fresh blood. Place, by means of the pipette, beside the blood, but not touching it, a drop of the saline solution and a drop of sherry wine, thus:—



Let fall a thin piece of glass upon the fluid and they will mingle in various proportions. A good eighth object glass is required; we use a middle eye-piece; and it is essential to see the tails, etc., that the edge or circumference of the mixed fluids should be looked at, and not the middle of the mass. We have made the experiment, with and without the saline solution, numberless times; and though never failing to produce tailed forms in some part or other of the mixed fluids, still we find it impossible to foretell what set of appearances will prevail *within* the corpuscles. Some one or other of the following forms will, however, be seen. Half an hour or more should be given for the best effects.



The way in which the wine and the saline solution take off all disposition of the corpuscles to adhere in rolls; the various prickly appearances which some of them assume; and the innumerable very different markings seen in the interior of others, are scarcely of less interest than the tails. Opinions may vary as to the nature of the motions seen in the tails. If there be motion in the fluid, the tails are of course influenced by it; nevertheless, there is a constant wavy movement, which seems independent of all motion in the fluid.

Where the undiluted wine has acted upon the corpuscles they are entirely deprived of their colouring matter, and a minute molecular matter floats in the surrounding fluid without molecular motion; but, where the wine is acting and producing tails, numerous and variously sized molecules are thrown off from the corpuscles; and these all have an intense molecular movement. The change which the fluid undergoes in consequence is well worthy of especial notice.—*British Medical Journal*, May 28 and June 4 and 11th, 1859.

CLINICS.

HOSPITAL NOTES AND GLEANINGS.

Silver Wires in Hydrocele.—We have previously referred to the subject of the treatment of hydrocele by the passage of wires through the sac, which plan of radical cure has proved successful in several cases under Mr. Pollock's care, at St. George's Hospital. On the 12th of August, he tapped a very large hydrocele of the right side in an elderly man, and withdrew about thirty ounces of fluid, containing a large proportion of cholesterine. A needle and wire were then passed through the canula and out of the sac. The canula being withdrawn, the wire was then tied, and thus formed a seton. A second case of hydrocele of the right side was likewise tapped, six ounces of fluid evacuated, and the same process adopted of introducing a wire seton.

These two made the fourth and fifth cases thus treated, and with success. The first instance was an example of encysted hydrocele of the cord, five months ago, the patient being in the hospital a week. No irritation was caused by the wire, but it produced an amount of consolidation of the parts sufficient to obliterate the cyst. The second and third cases were those of ordinary hydrocele. In these, however, there was not the same power of bearing the wire, and it had to be removed in forty-eight hours; in one it nearly produced suppuration, but at the same time the sac in each was obliterated.

Mr. Pollock considers the advantage of using the wire seton to be, that the patient suffers much less pain than when the sac is injected with iodine; in other respects, the results are about the same.—*Lancet*, Sept. 10, 1859.

Rupture of the Muscular Fibres of the Biceps Humeri.—A very curious phenomenon is the subcutaneous rupture of muscles and tendons, not produced by external violence, but by the contraction of the particular muscle to which the tendon belongs. The tendons are more commonly ruptured than the muscles; thus Sédillot found the former torn in 19 out of 21 cases, whilst in the remaining 8, the muscle was torn across. A countryman, sixty-five years of age, was admitted on the 18th of July into University College Hospital, with a rupture of the fibres of the right biceps humeri muscle, which took place five days before, when endeavouring to lift a calf on to a cart. The part of the muscle ruptured is that in connection with the long head of the biceps, and forms a prominent and hard tumour at the lower part of the arm. But immediately above the swelling is a great hollow or pit, and at its inner side the fibres of the other part of the muscle, arising from its short head, are felt entire. The force producing rupture, therefore, was exerted principally through the long head

of the muscle. At the moment of the rupture, the patient felt a sudden shock, as if he had received a blow. His arm has remained comparatively powerless ever since, although he can still flex it; some pain is present in the shoulder, arising, doubtless, from the tendon of the long head. The physical strength of the patient would seem to be perfect, but he has the aspect of fatty disintegration of issue, although by no means corpulent.—*Ibid.*

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The early Removal of Glossal Cancers.—When a malignant growth upon some part of the tongue has not only increased in size, but has become, perhaps, extensively ulcerated, the difficulty of complete removal is at once apparent, and we most commonly have recourse to other measures, which, sometimes, although rarely, may prove curative. The powdered sulphate of copper, as locally used by Dr. Marsden at the Cancer Hospital, has actually healed up ulcerated cancers of this organ—a fact of considerable importance. On the other hand, when a tumour is present on the side or anterior part of the tongue, and has only just commenced to ulcerate, if removed by the knife, possibly the patient may enjoy a complete immunity from the disease. Such a case came under notice on the 2d of August at Guy's Hospital, in the person of a woman seventy-seven years of age. A tumour of the size of a small chestnut appeared on the left side of the tongue, rather upon its anterior surface, had been slowly growing for six or seven months, and had commenced to ulcerate on its surface, the ulceration partaking of the usual character of epithelioma. It was excised by Mr. Hilton with a scalpel, and was not attended with any bleeding of consequence, although one small vessel required tying. The patient is doing very well, and the wound has healed. Early and complete extirpation of epithelioma, before any of the neighbouring lymphatics have become affected, offers, we think, as good a chance of non-recurrence in the tongue as in almost any other part of the body.—*Lancet*, Oct. 1, 1859.

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Simple Extension in Contraction from Burns.—We lately had the opportunity of observing the treatment of a case of deformity arising from an old burn in a little boy, nine years of age, under Mr. Coote's care at St. Bartholomew's Hospital, which is worthy of notice. It is a plan in use, we believe, at the Orthopædic Hospital, and consists in the proper application of simple extension, perseveringly carried out. The boy was admitted on the 7th of April, with his lips and mouth drawn downwards from a burn in the neck when an infant. The cicatrix possessed the usual characters of hardness and thickening. By suitable appliances the head and chin were kept extended, with the effect of bringing back the lower lips and jaw to their natural position, and getting rid of the extreme deformity which had heretofore existed. The mouth can now be closed.

The effect of extension is to cause the absorption of the adventitious material present in the cicatrix, and thus permit the latter not only to become soft and extended, but permanently to remain so.—*Lancet*, Aug. 13, 1859.

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A Vitreous Foreign Body successfully removed.—A popular notion prevails that wounds produced by contact with glass are of a very festering character, and that when portions of that substance remain lodged the danger becomes very much increased. In small wounds of the fingers and hands, wherein minute fragments of vitreous substances sometimes get forced in, much swelling and inflammation will occasionally ensue from the irritation which they cause; but, as a rule, glass cannot be said to be a greater irritant than many other foreign bodies. As a proof of this we cannot do better than refer to the case of a young man, at the present time in St. George's Hospital, who eight weeks ago was hurt by a skylight falling upon him, a portion of the thick splintered glass entering his right loin, as we understood, and subsequently passing down into the back of his thigh. A loose body could be very distinctly felt amongst the muscles in that part; and, after chloroform had been administered, an incision was made by Mr. H. C. Johnson over the projecting end, and a piece of thick glass, between four and five inches long and three-quarters of an inch wide, was withdrawn by the aid of a pair of forceps. This body had thus been lodged there for some weeks, yet the amount of irritation produced by its presence seemed comparatively trifling. The patient is doing well.—*Ibid.*

A Large Nutritious Artery of Bone.—If the student refer to almost any work on anatomy or physiology, he will find that scarcely a sentence is devoted to the consideration of the nutritious arteries of bone, beyond the mere mention of the locality of the nutritious foramina themselves. An examination of Mr. Quain's great work on the Arteries will equally disappoint him. It is to the very small, although not the less important, bloodvessels, which enter the minute foramina found on the outer surface of bone, that the growth, development, and nutrition of the osseous system depend. When a leg is amputated and a bone sawn across, there may be a little vascular oozing from the osseous section, particularly if there has been much irritative disease around it. We see this frequently when slices are removed from the articulating surfaces of joints. More rarely do we witness the pumping of blood from a distinct arterial trunk in the medullary canal itself. Such a peculiarity, however, in which the medullary artery was derived no doubt from the nutritious vessel, was seen at the Charing-cross Hospital on the 18th June. The left thigh of a young man, aged nineteen, a seaman, was amputated at its upper third by Mr. Canton for general necrosis of the entire tibia, with disease extending to the knee-joint, of a year's duration. When the leg was removed, a distinct pumping of blood took place from a rather large vessel, which could be distinctly seen in the medullary canal. It was as large as one of the interosseous branches of the radial artery given off in the palm of the hand, and of course could not be tied. Bleeding was arrested by applying a small plug of lint, which afterwards came away when the stump was nearly healed. The presence of a large nutritious artery in such a situation is a circumstance of much interest to both the physiologist and the surgeon.—*Ibid.*

A Tamarind-Stone lodged in the Windpipe of a Child; Expulsion after the Operation of Tracheotomy.—In the interesting case which follows, it is most probable that the small tamarind-stone was lodged in the right bronchus, from the fact of its being expelled, on coughing, from below the opening made in the trachea. There was not any visible change in the respiration of the two sides, and this would lead us to infer that complete obliteration of one of the bronchial tubes had not ensued, which partly accounts for the rapid expulsion of the stone when the trachea was freely laid open.

Of the various substances which have entered the windpipe, writers mention cherry, plum, and tamarind stones, natural and artificial teeth, fragments of bone, pieces of flint, food, nuts and nutshells, coins, buttons, shot, grass, beans and seeds, pieces of nutmeg, crumbs of bread, nails, &c. The symptoms of chest disease will vary according to the time the foreign body remains in the lungs, which may sometimes be for years, but they are usually those of chronic irritation of the lung.

William S———, a handsome-looking boy five years of age, was admitted into Lucas ward, St. Bartholomew's Hospital, under the care of Mr. Skey, on the evening of July 14th, with the following history: He had been playing with other children up to within twenty minutes of his admission, and had been up to that time in perfect health. Suddenly the mother's attention was drawn to the child by reason of its cries, and he seemed to be on the point of suffocation. It appeared that the children had had some tamarinds given them a little while previously; and the mother, believing that the symptoms were due to the presence of one of the tamarind-stones in the windpipe, turned the child with its head downwards, in the hope that the foreign body might fall out. This hope, however, was not gratified, and she at once sent the child off to the hospital. At the time of admission the condition of the patient was as follows: He was sitting up in his father's arms; the expression of his face was extremely anxious, but there was no lividity or duskiness of the face or lips. The extremities were quite warm. Respiration hurried; inspiration stridulous; cough ringing and metallic; in fact, the breathing and the cough resembled those heard in croup. The symptoms would now and then become less severe; and the child would fall back in a doze, again to be awakened after a few minutes by another paroxysm. Nothing could be detected in the pharynx by the finger. Air entered freely into the chest, and no difference whatever could be detected between the respiratory sounds on the two sides; and no information could be obtained as to the locality of the foreign body.

Operation an hour and a half after the accident.—The child was placed under the influence of chloroform, without exciting the least irritation in the trachea. The first incision was made rather long, extending from immediately below the cricoid cartilage to the sternum. On dissecting down to the surface of the trachea, some bleeding occurred. It was not considerable, but was sufficiently great to preclude any immediate attempt to open the air-tube. Mr. Skey therefore desisted for some minutes, during which the bleeding ceased. The trachea was then opened to nearly the whole length of the outer wound, and a pair of curved forceps introduced downwards towards the chest, and also in the opposite direction, without success. The edges of the wound in the trachea were then separated as widely as possible by means of a pair of sharp hooks, and shortly afterwards a sudden cough discharged the tamarind-stone with some force through the wound. The operation being satisfactorily completed, the extremities of the outer wound were approximated by means of plaster, the centre being left free. After the operation, Mr. Skey made the following observations:—

"Tracheotomy is an operation not very readily performed, and still less so when it is required to open the trachea low down in a child by gas-light. It is not always easy to hit the exact line of interval between the sterno-thyroid muscles, and this can only be effected by dissecting quite vertically from the surface on which the outer wound occupies exactly the mesial line. When exposed, the trachea should be opened freely, without regard to the thyroid isthmus. Unless time be an object of consideration (and it is rarely so urgent as to require the operation to be hastily completed), any reasonable number of minutes may be devoted to the entire arrest of bleeding. The size of the aperture in the trachea will depend on the motive dictating the operation. If for the escape of a foreign body such as a plum or a tamarind-stone, the opening should be large—in truth, as large as it can be made in a child of five years of age. In the case of this boy (as well as in that of a child operated on by Mr. Paget last year, who adopted my suggestion of considerably lengthening his incision in the trachea), the opening was very large, extending, I believe, through at least five or six rings of the tube. I doubt the expediency of the attempt to remove the offending body by means of forceps of any description yet invented. Preferable is it to await the return of cough, which, in the act of expiration, will inevitably carry the foreign body with the current of air through the larger and the nearer orifice in preference to the smaller and more remote. Inasmuch as we are supposed to be acquainted with the nature, and therefore can form a tolerably accurate idea of the size, of the foreign body, we can in some measure judge of the magnitude of the opening required for its escape. I am not aware of any great increase of danger or difficulty created by the division of a greater over a less number of rings, or, in other words, in making a large opening instead of a small one.

"The success of an operation of this kind is much dependent on the skilful co-operation of the assistant. In the above case, the edges of the wound in the trachea were held widely asunder by Mr. Savory; and when we consider the peculiar structure of the trachea, the importance of this duty must be obvious. In the recorded case of Mr. Paget, the same part of the operation devolved on me, and at the moment of escape of the foreign body, I was engaged in the act of dilating the opening in the trachea to the fullest extent it was susceptible of. I felt myself indebted to Mr. Cavory for his very efficient co-operation, upon which the success of the operation so largely depended."

July 15th. The boy has passed an extremely good night; skin pungently hot, and dry; respiration, 40 per minute; inspiration seems to take place entirely through the larynx, but expiration partly through the wound and partly through the larynx; pulse 140; tongue coated with a moist, whitish fur; the subcutaneous tissue over the right pectoral muscle is emphysematous; no morbid sounds in the chest. To have one-twelfth of a grain of tartar emetic, with half a drachm of simple syrup, in a drachm and a half of water, every second hour.

16th. The child is much better; the skin moist, and cooler than it was; respiration only 24 per minute, and no air passes through the wound, except when the child breathes very deeply or coughs; pulse 140; wound looking healthy; no morbid sounds in the chest; the emphysema has not extended; the bowels acted last night. To

leave off the antimonial draught, and to have half an ounce of the tartrate of soda mixture every four hours.

17th. The child is now sitting up in bed, playing with his toys; the wound is granulating up. To have a couple of eggs, milk, and beef-tea; also, twenty minims of the liquor of cinchona, and ten minims of the aromatic spirits of ammonia, in half an ounce of water, three times a day.—*Lancet*, Aug. 13, 1859.

CLINICAL LECTURES.

Practical Clinical Remarks on Acute Periostitis. Delivered at the London Hospital by T. B. CURLING, Esq., Surgeon to the Hospital.

GENTLEMEN: There are few operations more frequently performed in the hospitals of London than those required for the removal of necrosed bone, and they are certainly more common now than they were in former years. The results show that these operations are essentially of a conservative character—that tedious sinuses, always discharging and liable to inflame, have been enabled to close, and that useful limbs have been saved by the removal of a constant source of irritation. These operations have become more frequent, then, because surgeons have become more strongly impressed with the advantage of extracting locked up or impacted dead bone—have become less afraid of ill consequences from the necessary disturbance of parts, and have been emboldened to undertake tedious and troublesome operations, knowing that they can be rendered painless by chloroform. Our museums are rich in specimens of encased bone taken from amputated limbs; but such preparations are rarely added now, because it is seldom that a limb is removed for such a disease until the attempt to save it has been made by extracting the incarcerated bone. But so numerous are cases of necrosis in hospital practice that it is well to inquire whether we cannot, in many instances, prevent this serious result. The more common cause of necrosis in the long bones is acute periostitis, consequent upon injury, and the two following examples will illustrate the nature of this affection, and the mischief which results from the neglect of early and decisive treatment. The particulars of the first case are taken from the notes of the dresser, Mr. Michell.

CASE 1. *Acute periostitis of the femur, followed by a small necrosis.*—Martha L——, a servant-girl, aged fourteen, was admitted into this hospital Oct. 27th, 1858. She stated that on the 23d she was carrying a pitcher of water up some steps, when, owing to impaired vision consequent on nebulæ on the cornea after smallpox, she slipped and sprained her right knee. She slept but little that night, and next day was hot and feverish and unable to stand. The pain gradually became so acute that she could not bear to move her limb, and she continued to get worse until the period of her admission. At this time she had all the symptoms of acute sympathetic fever. The right lower extremity was much swollen, and she cried out with pain when the slightest pressure was made in the course of the femur, especially at its lower part. On the 28th I saw the patient for the first time. She had passed a sleepless night, and her symptoms were those above described. I could detect no fluctuation over the femur, but I at once determined to make an incision down to the bone at its lower and outer part. The integuments and vastus externus muscle were cut through, and the periosteum freely divided, when a small quantity of pus escaped, and it was ascertained by the finger that the membrane was detached from the bone. But little blood was lost. Pressure with a sponge was maintained for two hours, to prevent hemorrhage, and a poultice was afterwards applied. She felt greatly relieved by the operation, and slept well the night afterwards. The febrile symptoms subsided quickly, and, supported with a generous diet, she soon regained her health. The wound, after discharging pus for a few days, gradually filled up, till at length only a small sinus was left. It was ascertained, on examination with a probe, that a small portion of the femur was denuded; but, as she was able to get about, she was discharged March 10th, 1859, and directed, if the wound remained unclosed, to apply again for admission in three months' time.

She was readmitted in the May following. She was then in good health, had grown stout, and the muscles of the thigh were well developed. There was a sinus furnishing a slight discharge, and a probe passed down to the femur seemed to enter

an aperture and to grate against dead bone. On the 26th I cut down to the bone, chiselled away a small portion, so as to enlarge the aperture, and extracted two small pieces of dead bone from the interior. There was no bleeding of any moment. The wound afterwards closed up readily. She was discharged July 18th, the sinus being nearly healed.

The notes of the next case are furnished by the dresser, Mr. Welch.

Case 2. *Acute periostitis of the tibia, followed by extensive necrosis.*—Mary Ann C——, aged fifteen, a girl of strumous appearance, but who had generally enjoyed good health, was admitted into the hospital on Feb. 14th, 1859. She stated that she had struck her left leg rather severely four days previously, since which it had become swollen, and excessively painful. Fomentations were ordered by the house-surgeon, and I saw her for the first time on the 17th. She was suffering from high constitutional fever. Her pulse was 200; indeed it could scarcely be counted; her tongue being dry and furred, and her cheeks flushed. She had no appetite whatever, and had not slept a minute for two nights. Her leg and ankle were greatly swollen and red in patches. There were great tension and extreme tenderness in the direction of the tibia. I at once made a long and free incision over the bone, when a large quantity of pus immediately escaped with considerable force. The finger passed into the wound, came in contact with the tibia extensively denuded. She was greatly relieved by the incision, and the fever subsided rapidly afterwards. Abscesses, attended with a good deal of suffering and constitutional disturbance, formed subsequently over both malleoli. They were opened, and found to be connected with the bone. Her health became so much impaired, and her strength so reduced, and there was so much swelling above the ankle, with indications of the joint being affected, that amputation seemed to be called for. I had her placed, however, under the influence of chloroform, and then, on careful examination, finding the ligaments tolerably firm, and being unable to detect any crepitus, I determined to watch the case a little longer. Some improvement was shortly manifested, though her recovery was retarded by the formation of another abscess over the internal malleolus, which was also opened. The improvement afterwards continued, and by the end of March, under tonics and a generous diet, the patient's strength was greatly restored. The wounds closed up a good deal, leaving numerous sinuses leading down to dead bone, with healthy granulations. The head of the tibia appeared to have retained its healthy state, but the rest of the bone gradually became greatly enlarged, the thickening extending to the inner malleolus.

June 30th.—I laid open some of the sinuses, chiselled away a quantity of soft new bone, and removed several pieces of dead bone. The necrosis was irregular, consisting, in some places, of a thin scale from the surface; in others, of nearly the whole thickness of the tibia encased in new bone, and in some places of small portions of the interior inclosed in the original bone, thickened, and soft in texture. One of the latter was extracted quite from the lower end of the tibia, and this communicated with the sinus over the internal malleolus. Since this operation the patient has gone on extremely well. Her general health has improved; the sinus over the malleolus has closed up; the enlargement of the tibia has subsided, and the large wound has steadily healed up.

When we consider that the whole, or greater part, of a bone may be destroyed by acute periostitis—that the inflammation may extend to the adjoining articulations, imperilling the safety of a limb, and that patients sometimes sink under the constitutional fever attending it, I need not urge the importance of an early diagnosis of the disease, in order that right and prompt measures may be taken for its removal. The complaint for which acute periostitis is most liable to be mistaken is acute rheumatism; and it is a mistake which, I fear, is not unfrequently made in practice. Indeed, some care and nice observation are required to make the diagnosis. In rheumatism, as in periostitis, there is high inflammatory fever, with swelling of the limb, and great pain, increased by pressure, so that the patient is nearly helpless, and he shrinks from the touch of the surgeon, in dread of the torture which an examination may cause him. In periostitis, say of the femur or tibia, the swelling is diffused. It is not limited to the larger joints—to the ankle or to the knee, but occupies a wider range, and is œdematous in character. But

the chief diagnostic mark is the seat of pain. In periostitis little or no pain is caused by pressure, unless it be made over, or in the course of the affected bone. You may, in the early stage, move the limb at the knee or the ankle, and press the ligaments and tendons without producing pain, but the slightest pressure on the bone excites intense suffering. If you press over the tibia or the muscles of the thigh around the femur in rheumatism, you rarely cause much pain; but in acute periostitis such pressure cannot be tolerated for a moment. The conclusion in favour of periostitis will be much strengthened if it be found, as in the cases just related, that the attack of inflammation succeeded an injury.

The treatment commonly recommended in acute periostitis is local depletion with calomel and opium. Just at the onset of an attack, in a superficial bone like the tibia, this treatment may be of service, but in periostitis of a deep-seated bone, or if the inflammation do not speedily subside, such measures are not to be relied on. After matter has formed beneath the membrane they are worse than useless. They weaken the patient without exerting any influence on the disease. There is then no way of averting serious mischief but by a free incision of the inflamed periosteum. Some of you evinced surprise when, in the case of L——, on my first visit to the patient, though no fluctuation was perceptible, I determined at once to cut boldly through the thick vastus externus muscle down on the femur. There was, indeed, no other mode of preserving the bone. I was satisfied, after inquiring into the history of the case, and a careful examination of the limb, that the periosteum of the femur was acutely inflamed, and the incision revealed the presence of a small quantity of pus confined beneath it. The membrane was partially detached, and in a few hours extensive mischief would have ensued. This was arrested by the incision, and the almost immediate cessation of suffering, the rapid subsidence of the inflammatory fever, and the speedy restoration to health, were the satisfactory results of this decisive treatment. What would have been the condition of the patient had the operation been delayed, may be learned from the second case. I did not see C—— until after a large suppuration had taken place. The periosteum was extensively detached, and so distended by the pus effused beneath it, that when an opening was made, the matter gushed out with force over my clothes. In the first case, notwithstanding the early relief by an incision, slight death of bone ensued; but in the second case the necrosis was very extensive, and the inflammation having affected the cancellous tissue in the lower end of the tibia, the ankle-joint became at one time in jeopardy. Additional incisions were required, and under this treatment the urgent symptoms at length subsided, the inflammation in the periosteum and bone, and the necrosis, ceased to extend, the work of restoration was set up, and the case had a favourable issue.—*Lancet*, Sept. 3, 1859.

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Practical Clinical Remarks on Surgical Openings into the Knee-Joint. Delivered at the London Hospital. By JOHN ADAMS, Esq., Surgeon to the Hospital.—Gentlemen: I avail myself of the fact, that I have lately had under my care in the hospital four cases in which I have thought it necessary to open the knee-joint, to bring the subject of suppuration of this joint before you; and the first question which suggests itself to us is this: Is it desirable, or necessary, to open by incision so large and complicated a joint as that of the knee? And this question suggests itself because you have been taught, and the teaching is correct, that an opening into a joint is a very serious affair, and ought not to be undertaken without very careful consideration of all the circumstances attending the case.

Some years ago a man was brought into this hospital who had been bitten in the knee by a tiger. There was no doubt that the joint was penetrated by the tooth of the animal, as the usual sign of penetration was present—namely, the escape of synovia. The case was treated in the ordinary antiphlogistic manner, but suppuration occurred, with great constitutional excitement and irritative fever, and the limb was amputated. The man speedily succumbed. Matter was found distending the joint. Now I have no hesitation in stating that the practice in this case was bad, and that instead of the amputation, a free incision ought to have been made into the knee-joint to give exit to the matter. It is, however, probable that under any circumstances, the patient would have sunk, as the articular cartilages were wholly destroyed, and am-

putation would still, probably, have been resorted to.

I was requested by the surgeon who had attended the last case, to meet him in consultation on the case of an old gentleman, who had a considerable collection of fluid in the knee-joint. There appeared but little doubt that suppuration had taken place, and it became a question, whether it ought not to be opened. A free incision was made into it, and a large quantity of matter was let out. The joint was strapped and bandaged, and the matter did not re-accumulate, but in a fortnight the joint became completely anchylosed. The old gentleman sank, however, from internal disease, and no examination was permitted.

These two cases are not parallel, but the last illustrates the position, that an opening into the knee-joint, for the evacuation of matter, is necessary, and may be made not only with impunity, but with great advantage.

Let me now direct your attention to the cases you have witnessed yourselves, and point out to you the circumstances leading to the necessity of free incisions into the knee-joint. The four cases are all different in many very important respects. The first is that of a man of about forty-five years of age, who was admitted into the hospital in consequence of a compound fracture of the patella, which necessarily caused an opening into the knee-joint. The treatment pursued in the onset of this case was, in my opinion, quite judicious, as a laudable attempt to save the limb was made; and, the parts being accurately adjusted, the limb was kept in an extended position, and the usual antiphlogistic means being had recourse to, the wound over the patella soon healed. But the case did not progress satisfactorily; for, inflammation occurring, abscesses formed in various directions, some superficial and others very deep, so that I was compelled to cut through the muscles of the calf to remove some dead fascia which kept up the discharge. After this, pus formed in the interior of the knee-joint, and I was compelled to make incisions on either side of the patella at different times, to give exit to the matter. After struggling on for a length of time, anchylosis of the knee took place, at an angle certainly not quite convenient for freedom of progression; but I hope the limb will eventually become useful, as all discharge has ceased for a considerable time.

The next is the case of a man, aged about sixty, who was admitted in consequence of some obscure inflammation of the leg after an injury. The case was progressing favourably, when a deep-seated swelling formed in the ham, and, after a few days, deep fluctuation was detected, which led me to make a very cautious opening, through which a large quantity of pus was evacuated. The opening was enlarged, and it was found that the matter came from between the heads of the gastrocnemius externus, and close to the large bloodvessels in the popliteal space at the back of the posterior ligament of Winslow. Nothing untoward happened for some days, when the abscess ceased to discharge, and the knee-joint began to swell. The swelling increased day by day, and evidently indicated suppuration in the knee-joint. Now this was very remarkable, because it appeared as if the matter had made its way from the popliteal space into the interior of the joint through the posterior ligament; at least, it appeared so to me. However, severe constitutional irritation occurred, and it became requisite, from the tension of the joint, to do something for the patient's relief. I had some idea of amputating the limb, but it was determined, at a consultation with one of my colleagues, to make an attempt to save the limb, and, to effect this, to make a free incision into the joint. I therefore opened the joint, first on the inside, and, at an interval of ten days or a fortnight, on the outside, and gave exit to a large quantity of sero-purulent fluid on both occasions. The man has struggled through, with a constitution evidently damaged by hard living and severe labour, and is progressing favourably now; but the opening still remains patent on the outside of the knee, and the fungous nature of the granulations points at some deep-seated disease, probably of the bone itself. I cannot speak very favourably of the case, but I think enough has occurred to show me that, if his constitution were sound, he would make a fair recovery, with an anchylosed joint. I have now directed him to be sent into the country for the benefit of his health. The case is remarkable, from the peculiar course which the abscess appeared to take, having made its way from the popliteal space into the joint itself. I feel satisfied in my own mind that amputation of the thigh would have been attended with a fatal

result, from the defect in the man's constitution; and, therefore, although the cure is as yet imperfect, I am under the impression that no other treatment could feasibly have been adopted than the one I pursued; at any rate, it proves that you can open the knee-joint without destroying life or limb.

The third case is one of a lad about twelve or thirteen years old, who was admitted in a very advanced stage of low fever. He had also considerable swelling of the left leg, consequent on inflammation of the subcutaneous cellular tissue. A large abscess formed over the head of the tibia, which I opened. After this, matter formed very deeply along the outside of the knee-joint, and this I opened. Soon afterwards the joint itself became much swollen and painful, and was tense with fluid. I suspected matter in the joint, and made a free incision into it. I found a large collection of pus, and the articular cartilages extensively eroded. I could not advise amputation, as he was still labouring under symptoms of low typhus fever; and he sank, after a few days, with signs of general pyæmia.

In this case it was apparent from the beginning that no operation was advisable except that of opening the joint to give exit to the matter. It is of no use amputating in such cases, as the constitutional disease (probably the cause, rather than the result, of the local mischief) could not be benefited by so violent a procedure. And I cannot help thinking that operations performed under such conditions, fatal as they always are, bring discredit upon surgery, inasmuch as they are always and unexceptionally attended with the loss of life.

Now, the last case of this series to which I shall direct attention is one now under treatment, and is that of a man whose limb I amputated in consequence of extensive injury to the ankle-joint. The case is interesting as showing how much the constitution can bear under very unfavourable circumstances, and under a most complicated series of affections. The man's condition has been no doubt materially injured by a habit he acquired in China of eating opium to a large extent.

He was admitted three or four months ago in consequence of extensive injury to the left ankle from the falling of a heavy weight on his leg and foot, by which he sustained a fracture of the tibia above the malleolus; and the fracture being exposed, it may be termed a compound fracture. Sloughing of the skin over the inside of the leg and ankle laid bare a large portion of the tibia, which protruded to a great extent, being detached from the lower fragment, which remained in connection with the astragalus; this, however, becoming subsequently detached, was removed by the dresser. About four inches of the protruding tibia was dead; the consequence was that extensive suppuration was going on, and there was no possibility of repairing the mischief without amputating the leg or removing the dead bone. On consultation, it was determined to saw off the dead bone. There was no difficulty in doing this; and there appeared to be a fair prospect of success, as granulations of a very healthy character shot up from every part of the exposed surface. However, after three or four weeks, the man got materially worse, and the granulations assumed an unhealthy aspect, and, as his constitution seemed evidently suffering from the long-continued drain, I thought it right to amputate below the knee. The operation was performed very high, just below the knee, on the principle advised by Mr. Teale in amputation of the thigh. The skin of the upper surface of the stump sloughed to a slight extent. During the progress of the case, hemorrhage to an alarming degree occurred from the popliteal artery, and this was secured by Mr. Ward, who laid open the stump to reach it. His progress was satisfactory until inflammation attacked the knee-joint, and a large quantity of fluid was poured out, and which presented itself towards the inner side, as is usually the case. I opened this freely, and let out a large quantity of sero purulent fluid, by which the patient was relieved. The only additional circumstance I need mention in this case, is the fact that, the opening on the inside of the knee becoming closed, a large abscess has formed in the bursa beneath the tendon of the rectus, which frequently communicates with the joint itself. There is every prospect of cure.

Thus, you perceive, that at the same time I have had four cases under my care, in which I have thought it advisable to open the knee-joint. And I may ask the simple question, why should you fear to open this joint? You may be quite certain of this, that where suppuration has taken place, it is absolutely necessary that you should

adopt this procedure, as there is no chance whatever that the pus can be absorbed under the circumstances mentioned in the preceding cases. I think the custom of freely opening the joint is due to the writings and practice of Sir Benjamin Brodie, and I am sure that you cannot commit a more fatal error than to leave patients unrelieved of abscess in the interior of the joint, under the impression that you are likely to add to the mischief already existing by opening so large a joint as that of the knee. Let me give you this piece of advice; if you determine to cut into the joint, let your incision be free, and do not trouble yourself by squeezing the matter out with your hands, but lay a flannel, soaked in warm water, over the part, and allow the cyst itself, by its inherent faculty of contraction, to force out its contents. In most cases, it is desirable to leave the opening patent, and not to trouble yourselves to bring the edges of the wound together by strapping and bandaging, although this practice may sometimes succeed. You have seen cases in the hospital where the constitution has been infected with that very fatal blood-poison to which the term pyæmia is given; and, in many of these cases, abscesses form in the various joints of the body. In such cases, I would especially advise you to make free incisions into these abscesses, and the result of my experience is that by such treatment many lives are saved.—*Lancet*, Aug. 13, 1859.

MEDICAL NEWS.

DOMESTIC INTELLIGENCE.

Antiperiodic Properties of the Hypophosphite of Quinia.—Dr. A. B. Cook states that he has prescribed the hypophosphite of quinia in five cases of intermittent fever, in all of which the medicine acted promptly and efficiently. It was exhibited in pilular form, each pill containing two grains of the salt, with q. s. of the ext. gentian to make mass. In each case twenty grains were exhibited during the intermission, the quantity taken at each dose, and the intervals between the doses being regulated by the length of the intermission. In all the cases I endeavoured to have the whole quantity taken at least two hours previous to the access of the paroxysms. The same quantity (20 grs.) was exhibited on the next or second day following, as the case proved to be of the quotidian or tertian type; after which five grains were given daily for four or five days. From two to three weeks have now elapsed, without a recurrence of chills in any of the cases treated.

Three of the patients were interrogated with reference to the head symptoms, and in no instance was any allusion made to those disagreeable sensations (as buzzing and singing in the ears), which so frequently follow the administration of the sulphate in even small doses.—*Semi-Monthly Med. News*, Oct. 15, 1859.

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Burning Fluid, Camphene, &c.—The number of deaths caused by accidents from the use of these articles has been so great as loudly to call for legislative enactments to prevent their future employment.

Mr. E. Meriam, of Brooklyn, states that he has kept a record of deaths, injuries, and conflagrations, resulting from the use of camphene and other burning fluids used for the purpose of illumination, since July 23d, 1850. Since that date he has recorded the deaths of three hundred and seventy persons, and the injuries of four hundred and seventy-seven persons, many of the latter of whom the accounts stated were not expected to survive the injuries they received. The losses by fire from these fluids he estimated at upwards of one million of dollars. Mr. Meriam says that when the weather becomes hot, in summer, the danger in the use of burning fluids will increase. In the short term of thirty-six days within the present year, he had recorded the death of nine persons by camphene and burning fluid.

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Subcutaneous Injections.—The committee appointed by the American Medical Association, at its last meeting, to report on subcutaneous injections of medicines in general, and especially of preparations of Peruvian bark, in intermittent fevers and other diseases, request the co-operation of the profession. They desire that physicians who wish to have their observations incorporated in the report of the committee, will transmit such observations to the chairman of the committee, Dr. IGNATIUS LANGER, at Davenport, Iowa, before the 15th of May next.

OBITUARY RECORD.—Died, at Mount Holly, N. J., on the 22d of Sept., Dr. GEO. F. LEHMAN, in the sixty-fourth year of his age. Dr. L. was for many years Lazaretto Physician, and contributed a series of valuable papers to the early volumes of the *American Journal of the Medical Society.*

——At Columbia, S. C., on the 20th of Sept., Dr. E. H. BARTON, of New Orleans.

FOREIGN INTELLIGENCE.

Woorara as a Remedy in Traumatic Tetanus.—At the meeting of the Academy of Sciences, on August 29, a most interesting paper, on the Use of Woorara as a Remedy in Traumatic Tetanus, was read by M. Cl. Bernard, on the part of M. Vella, a distinguished physiologist of Turin. I may mention, before giving an abstract of this paper, that as far back as 1850, M. Bernard showed that woorara, while it destroys the peculiar properties of the motor nerves, exercises but little influence on the nerves of sensation, and that it so acts on the motor nerves as to cause paralysis of them, beginning at the periphery of the nerve and proceeding gradually to its centre; this being an action the reverse of that observed in the ordinary paralysis of these nerves. Muscular contractility is, according to the same physiologist, quite distinct from, and independent of, the nervous influence which calls it into action, for he has proved that after the woorara poison has completely destroyed the conducting power of the motor nerves, the muscular tissue continues to contract when it is directly irritated by electricity or other stimulants. Proceeding on the accuracy of these views, M. Vella instituted a lengthened series of experiments in 1856, which led him to conclude that there is a direct antagonistic action as regards their effects on the nervous system, between strychnine and woorara; in other words, that the effects produced on animals by one of these poisons, can be neutralized by the other. M. Vella, who, during the late war, was attached to the French Military Hospital at Turin, having observed several cases of tetanus among the wounded, in which the use of opium, ether, and the usual remedies had failed, deemed it a fitting opportunity for the application to the human subject of the experience he had derived from his observations on animals. His first experiments were made on two soldiers, both suffering from tetanus; in the one the affection was of four, and in the other of five days' standing. Both were in a state of demi-asphyxia, and their recovery altogether hopeless; notwithstanding this, however, the application of woorara was followed by a certain amount of muscular relaxation, and of general relief to the patients, although both, in the end, terminated fatally. In a third case, the experiments were more successful, and the patient was discharged from the hospital perfectly cured. The subject was a French sergeant who had been wounded on June 4, at the battle of Magenta, by a ball which had caused an incomplete fracture of the first metatarsal bone of the right foot, with laceration of the tendons and soft parts. He entered the hospital on June 10 under the most favourable circumstances. Three days afterwards the ball was extracted, and the operation relieved him of much of the pain which the presence of the foreign body had caused him. On the third day after the extraction of the ball, stiffness of the neck made its appearance, attended with difficulty of moving the jaw and the head. There were also slight convulsions, but these were of short duration. The day following the jaws became firmly locked, rendering it at times impossible for him to open the mouth. On the 18th the occurrence of trismus, opisthotonos, and other characteristic symptoms, left no doubt as to the serious character of the disease, and it was declared by all the surgeons attached to the hospital to be general tetanus. The condition of the man was so serious and alarming that M. Vella deemed it necessary to bleed him from the arm for the purpose of relieving the asphyxia with which he was threatened. He then, after having freely incised the wound, administered a powerful dose of opium, but these measures produced no good result. On the afternoon of the same day, he decided on the application of woorara to the wounded foot; the dose being in the proportion of two grains of woorara to an ounce and a third of water, applied in the form of compress; the strength of the solution was gradually increased until it reached the proportion of twenty grains of the woorara to nearly three ounces of water. Three-quarters of an

hour after the application of the weaker solution, and half an hour after the more powerful was employed, a visible diminution of the tetanic rigidity was the result, followed by such complete muscular relaxation, that the patient was almost immediately able to drink, to take soup, to urinate, and to set up in bed. At the commencement of the treatment it was remarked that as soon as the peculiar physiological effects of the woorara began to pass off, the tetanic spasms reappeared with as much violence as ever, and that the wounded leg was always the first part of the body affected by them. After three days of this treatment a large blister was applied to the thigh, in order to secure a more extensive absorbent surface, and the solution was applied to it as well as to the wound of the foot. For four days the dressings of the entire absorbing surface were renewed every three hours, then every five hours up to the twelfth day, when they were reduced to twice in the twenty-four hours. It was remarked by M. Vella that the wound of the foot and the raw surface produced by the blister were not irritated by the application of the woorara, as they healed very rapidly. M. Vella resumes his case in the following language: "The woorara, which for the first eight days succeeded in rendering greater the interval between the paroxysms, and in diminishing their intensity, ended by making them disappear entirely; and on the 10th of July the patient was able to leave his bed for the first time without experiencing any convulsive shock." On the 15th he went out for an hour, and on the 25th of the same month he left the hospital perfectly cured. M. Vella terminated his remarks by expressing a wish that this novel treatment should be repeated by other practitioners in cases of a like nature; he, however, adds that the tetanus should be attacked as near its *début* as possible, and before it has too seriously implicated the vital organs, especially the lungs. M. Vella also proposes the same treatment for hydrophobia; the want of opportunity only has prevented him, long ere now, from employing it in that formidable disease.—*Med. Times and Gaz.*, Oct. 1, 1859.

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Poisoning with Acetate of Morphia.—The *Gazette des Hôpitaux*, of the 13th September, mentions a case taken from the *Union Médicale de la Gironde*, in which a young pharmacien of Bordeaux took, in a wafer, fifteen grains of acetate of morphine, soon after dinner, with suicidal intentions. He walked home, a quarter of an hour afterwards, perfectly calm; but in a short time fell, as if thunderstruck, amidst the people with whom he lodged. Some time elapsed before Dr. Salviat arrived, two hours having expired since the morphine had been taken. The young man was lying on a mattress placed on the ground, quite insensible, the teeth clenched, the limbs relaxed, the eyes staring and unaffected by light, the face flushed, pulse full and somewhat quick. Dr. Salviat, not knowing the cause of this state of things, diagnosed cerebral congestion, and bled the patient from the arm. Whilst the blood was flowing, the patient opened his eyes, and seemed to recover his senses. He was then asked about the cause of the symptoms, and answered that he had taken fifteen grains of acetate of morphine. An attempt was now made to administer a large dose of tartar emetic, but this was found impracticable, as he relapsed into complete insensibility, with the teeth firmly clenched. The heated steel knob was now used over the epigastrium and abdomen, but to no avail, and the medical attendant went away despairing of his patient, leaving, however, directions that the solution of four grains of tartar emetic should be given if the patient recovered sufficiently. (We wonder that flagellation, or forced movements, were not resorted to before the doctor left.) Towards four o'clock in the morning the young man awoke, and took the emetic, which acted well, and afterwards some strong coffee, which had been prepared by Dr. Salviat's desire. At seven in the morning the latter returned to his patient, and found him better, though the coma was still complete. Questions were, however, pretty well answered, and the poor fellow stated that he had tasted the morphine in the matters ejected from the stomach. The egesta were, however, unfortunately not kept. A second emetic was given, as the vomiting had not been very copious the first time, and a strong solution of tannin was administered after the vomiting had ceased. The patient recovered perfectly, thirty-six hours after the ingestion of the morphine, and presented, after the coma was over, all the symptoms mentioned in medico-legal works as resulting from poisoning with morphine,

except contraction of the pupils. No doubt remained as to the dose and the quality of the morphine, as the young man had prepared it himself in a wholesale house, where he had been employed at Paris. Dr. Salviat thinks that this recovery, after so enormous a dose of morphine, is to be attributed to the salt having been taken soon after a meal, and wrapped in a wafer. Some of it had probably been absorbed, and the rest mixed with the food. As digestion was suspended by the coma, it is likely that the greater part was not absorbed, and that it was afterwards rejected with the vomited matters, the patient having tasted the morphine when throwing it up.—*Lancet*, Oct. 1, 1859.

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New Stethoscope.—M. Kergaradec informs his Academy that Dr. Pitta, a Madeira doctor, has made some modifications in the stethoscope, which are of great utility, improving the instrument considerably. M. Bouillaud, who has tried the said modified instrument, confirms the praises of it, and hopes that it will become generally adopted.—*Med. Times & Gaz.*, Oct. 1.

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Nicotine in Tobacco.—The quantity of nicotine in tobacco varies much according to the locality from whence it is taken. From Havana tobacco 2 per cent. is obtained; and a like quantity from Maryland and Virginia; from Alsace tobacco 3 per cent.; from tobacco *du Nord* 6 per cent.; and 8 per cent. from tobacco *du Lot*, and from Algeria. Hence it seems that the cheapest tobacco contains the greatest quantities of irritating matter, and we get, it is said, an explanation of the frequency of cancers of the lip in the southern districts of France.—*Ibid.*

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Cancer of the lips is so common, we are told, at the Hôpital St. Eloi, as to be the most frequent cause of operations there. M. Bouisson attributes the disease to smoking.

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Baron Liebig broke his leg at Passau on the 5th of Sept.; his case is progressing favourably.

The Baron is said to have discovered the way of imparting to ordinary tobacco the flavour of the finest Havana.

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Crinoline.—It is stated in a recent No. of the *Med. Times and Gaz.* (Oct. 1) that during the last three weeks, three deaths from burning, resulting from the exorbitant use of crinoline, have been reported in the journals.

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Obituary Record.—Died, near Edinburgh, Sept. 22d, in the 70th year of his age, William Pulteney Alison, M. D., Emeritus Professor of the Practice of Medicine in the University of Edinburgh, and one of the brightest ornaments of our profession.

TO SUBSCRIBERS.

The book which has been passing through the Library Department of the Medical News, "Habershon on the Alimentary Canal," will be completed in the number for December. The work selected for the year 1860, is—

CLINICAL LECTURES ON THE DISEASES OF WOMEN,

BY PROFESSOR SIMPSON, OF EDINBURGH,

which will be commenced in the January number.

These lectures, which have been appearing during the past year in the "London Medical Times," have been published under the supervision of the author, and carry with them all the weight and authority which his distinguished reputation and extended experience can give. They are thoroughly illustrated with numerous handsome wood-cuts of pathological conditions, instruments, etc., and cannot but form a very attractive feature in the "News," and prove of much value to the general practitioner.

Subscribers to the "American Journal of the Medical Sciences" who desire to secure this important series of lectures, and without cost, will do well to remit their subscriptions (Five Dollars) for 1860, in advance.